NASA Weather Research Roadmap

Steps to help the nation achieve improvement in near-term forecasts using NASA's latest data and modeling research.

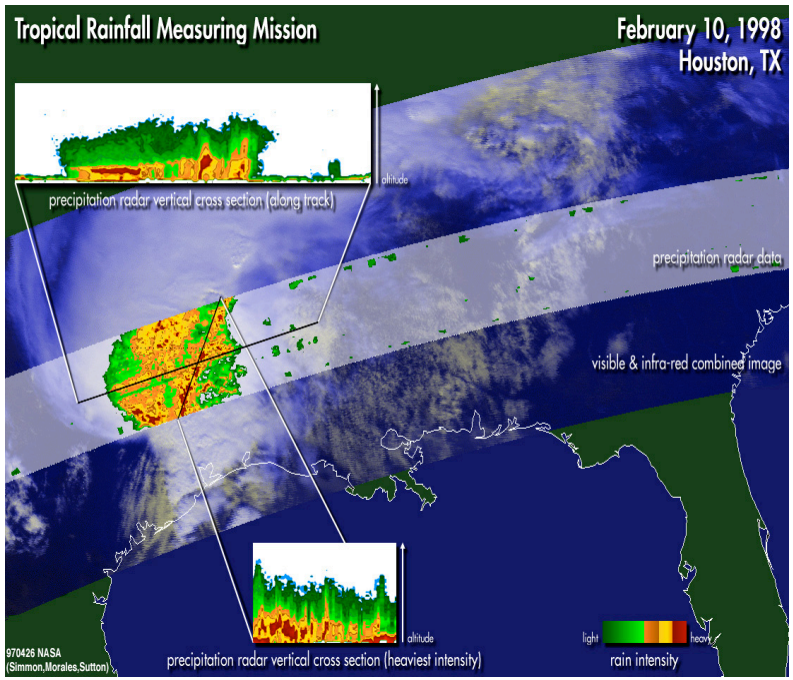
A Combined Vision of NASA, NOAA, and the Research Community

Weather Prediction

How can improvements in weather prediction be realized? What are the most important needed investments in observations and modeling technologies and how can they best be transferred to operations?

Background and Issues:

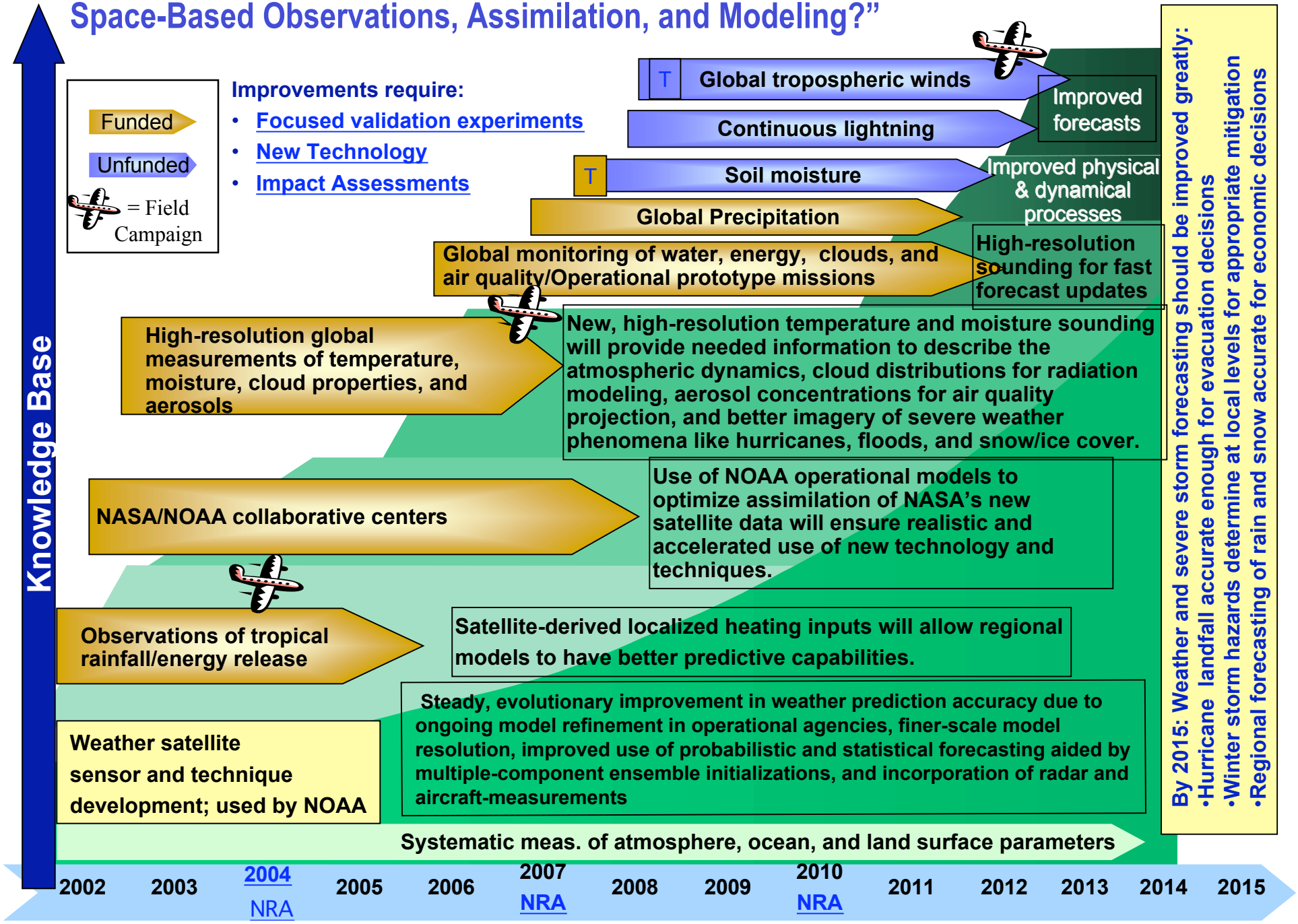
- **Improvements in weather prediction have great social, economic value**
- **Goals are jointly worked with other agencies via USWRP and other interagency activities**
- **Better forecasts needed for hurricanes, severe thunderstorms and tornadoes, winter-time storms, and flash floods**
- **Improved and new measurements are needed to make the required progress**



Why NASA?

- NASA space-based measurements, numerical modeling, and data assimilation have already made great contribution
- Technology for new global (space-based) observations needed can only be developed and flight-proven by NASA
- NASA will need to continue leadership role in how to best use new space-based measurements in data assimilation/forecast systems
- NASA and other agencies will partner on the technology transfer

"How Can Weather Forecast Duration and Reliability Be Improved By New Space-Based Observations, Assimilation, and Modeling?"



National Weather Forecast Improvement Goals (1 of 5)

TODAY:	GOALS for 2010:
3-day forecast at 93%*	5-day forecast at >90%*
7-day forecast at 62%*	7-10 day forecast at 75%*
3-day >1” rainfall forecast, low skill	3-day rainfall forecast routine
3-day severe local storm forecast with low-moderate confidence	7-day severe local storm forecast, mod. to occasional high confidence
Thunderstorm occurrence to _ hr (within 25 nm)	Thunderstorm occurrence (convective initiation) to 3 hr
Tornado lead time 10 min	Tornado lead time 18 min
Hurricane landfall	Hurricane landfall
+/- 400 km at 2-3 days	+/- 100 km at 2-3 days
Air quality day-by-day	Air quality forecast at 2 days

*Accuracy refers to sea-level pressure in N. Hemisphere winters

Road Map

FY04 Goal

Satellite derived localized temperature and moisture profiles will allow regional models to have improved predictive capabilities and ensemble modeling will permit estimates of weather probabilities.